GOVERNMENT OF NEWFOUNDLAND AND LABRADOR

GUIDELINES FOR THE APPROVAL OF A HIBERNIA DEVELOPMENT PROGRAM

Submitted to
Mobil Oil Canada Limited

JULY 1981

ISSUED UNDER THE AUTHORITY OF
THE HONOURABLE LEO BARRY, Q.C.
MINISTER OF MINES AND ENERGY

GUIDELINES
FOR THE APPROVAL OF A
HIBERNIA DEVELOPMENT PROGRAM

SUBMITTED TO
MOBIL OIL CANADA LIMITED

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FINAL VERSION
JULY, 1981

PETROLEUM DIRECTORATE
GOVERNMENT OF NEWFOUNDLAND AND LABRADOR

ISSUED UNDER THE AUTHORITY
OF
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Introduction

Development Program Approval Process

The Newfoundland and Labrador Petroleum and Natural Gas Act, 1965, is an act respecting the management of petroleum exploration and development offshore the Province. The Petroleum Regulations, 1977 pursuant to this Act set forth the conditions and procedures of an approval process for the conversion of permit areas to lease for the purpose of development.

The Regulations require the permittee to submit to Government a proposed Development Program which details proposed development activities, production and transportation methodologies and facilities, and the potential social, economic and ecological consequences of the development alternatives. The Development Program is then subjected to an Approval Process which involves public hearings, thereby permitting public examination of the overall characteristics, and the desirability, of the proposed developments.

The guidelines in Part I of this document elaborate on specific sections of the Petroleum Regulations which relate to the Process for Approval of a Development Program.

Environmental Impact Assessment

One part of the required Development Program Documentation is a detailed environmental impact statement. In May 1980, the Newfoundland and Labrador Environmental Assessment Act was proclaimed. This Act provides a mechanism whereby environmental concerns of a proposed development can be reviewed by a technical assessment committee and recommendations on the environmental acceptability of the proposed undertakings can be made by the Minister of the Environment. Consequently, the Environmental Impact Statement of a Development Program Proposal is prepared according to the provisions and guidelines respecting the Environmental Assessment Act, 1980.

Part II of this document contains guidelines relating to the preparation of an environmental impact statement according to the Environmental Assessment Act.

Public Review

Submission of the Development Program Proposal initiates the limited period, public review process under the Petroleum Regulations. The review and approval process involves mandatory public hearings under a Commissioner appointed pursuant to the Public Enquiries Act. Since the Environmental Impact Statement forms part of the Development Program Documentation, the issues therein would be dealt with during the public hearings under the Development Program Approval Process. Public Hearings under the Environmental Assessment Act are a discretionary requirement and are not necessary in cases where the Environmental Assessment Process is initiated in conjunction with the Development Program Approval Process.

Timing of Process and Approval
(see schematic)

Guidelines for the Approval of a Hibernia Development Program were issued in draft form in January, 1981. These guidelines contained two parts. The first dealt with specific sections of the Petroleum Regulations which relate to the Development Program Approval Process. The second contained guidelines related to the preparation of an Environmental Impact Statement (a requirement under the Petroleum Regulations) according to the Newfoundland and Labrador Environmental Assessment Act.

Comments resulting from public review of the draft guidelines and detailed discussions with the permittee have been considered in this final version. Continuation of the approval process, including the formal public review, will be initiated when the permittee submits the Development Program.

In the meantime, the Environmental Assessment Process has been initiated and the permittee will submit to Government Draft Terms of Reference for the impact statement. In this document the permittee indicates to Government how the various issues detailed in the guidelines will be addressed in the environmental impact statement. This Terms of Reference document will be made available for public review and comment before the Minister of Environment accepts final terms of reference for the Environmental Impact Statement.

The Environmental Impact Statement is one part of the required Development Program Documentation, however, it may be submitted to Government, and thus made public, on or before the date of submission of the Development Program Proposal. This would permit a preview of the proposed development alternatives and the identification of deficiencies in documentation before the formal eight (8) month review process begins. This review process is initiated when the Development Program Proposal is

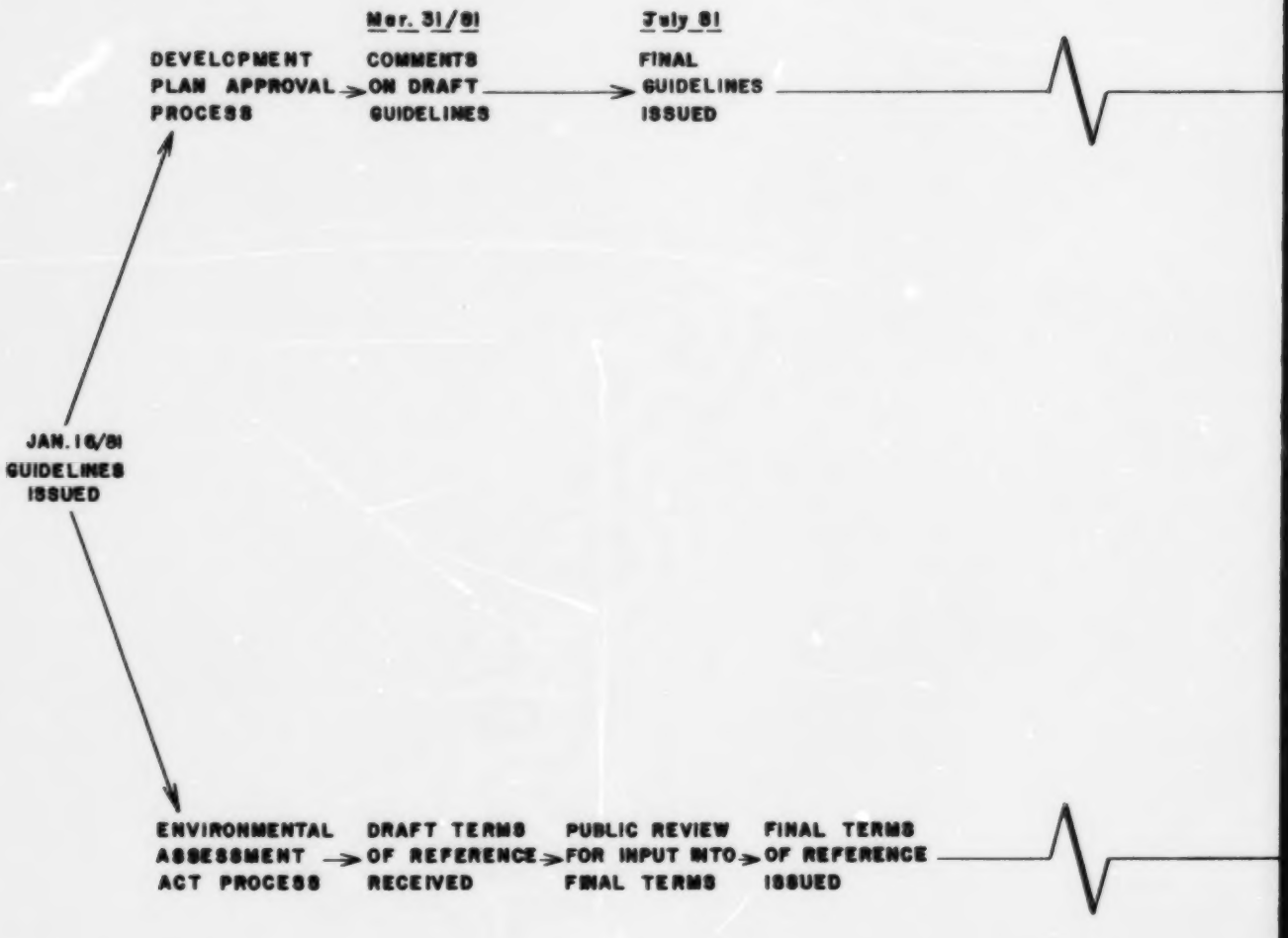
submitted.

Public hearings will begin within 120 days (4 months) of receipt of the Development Program Proposal. Public hearings will continue for a maximum period of three months. Within one (1) month of the conclusion of public hearings, the Commissioner will make public and submit recommendations to the Minister of the Petroleum Directorate.

The Minister of Environment will make recommendations (after completion of the public hearings) to Cabinet on the environmental acceptability of the proposed undertakings. The Minister of the Petroleum Directorate will make his recommendations to cabinet at this time, and within a period of 240 days of submission of the development plan, the Minister will approve, approve in principle, or reject the development program.

HIBERNIA

Development Program Approval Process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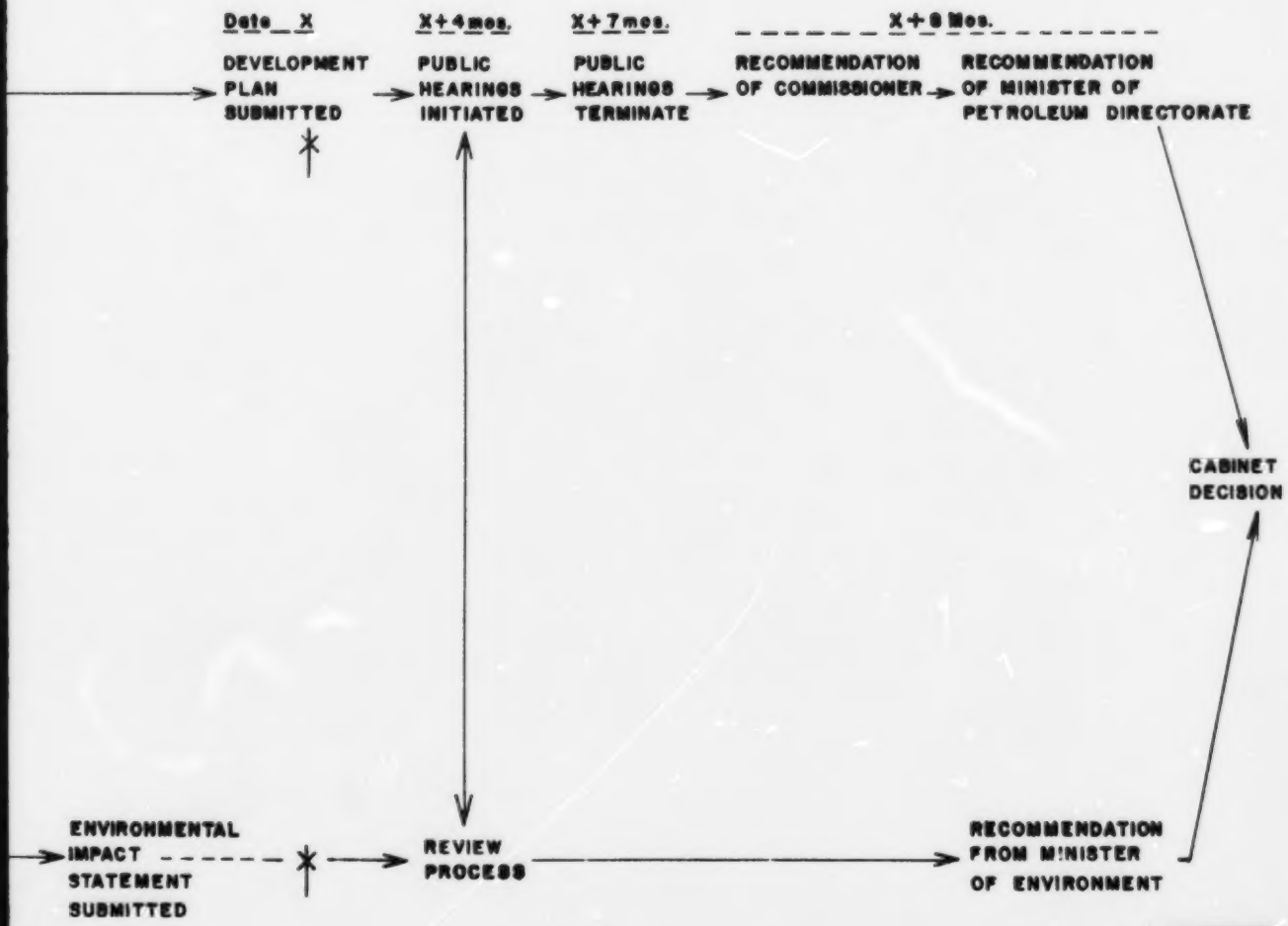

Petroleum Directorate

Government of Newfoundland and Labrador

PART I

GUIDELINES FOR A HIBERNIA DEVELOPMENT PROGRAM APPROVAL PROCESS

GUIDELINES

FOR THE APPROVAL OF A

HIBERNIA DEVELOPMENT PROGRAM

Submitted To

MOBIL OIL CANADA LIMITED

Final Version
July, 1981

PETROLEUM DIRECTORATE

GOVERNMENT OF NEWFOUNDLAND AND LABRADOR

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1. The Exploratory Permit

Exploratory drilling offshore Newfoundland and Labrador can only be conducted on the basis of a permit granted by the Government of Newfoundland under the Newfoundland and Labrador Petroleum Regulations, 1977 pursuant to the Petroleum and Natural Gas Act.

Sub-section 43 (1) of the Petroleum Regulations gives the permittee the exclusive right to drill for petroleum in the permit area and to convert to lease all or any part of the permit area underlain by any discovery made by the permittee. The permittee may carry out extension drilling under the definition of exploration given in Sub-section 2 (g).

The permittee, however, may not, prior to the development program approval process, carry out any construction or on site preparations in order to develop the discovery. These activities may only be carried out on the basis of a lease. For instance, the excavation of the seabed to prepare for the placement of manifolds, etc., (except on an approved or experimental basis) is considered a development activity. The drilling of wells for the purpose of the development of the oilfield (even if such wells are drilled from a floating drilling rig) is also considered a development activity. Such activities cannot be carried out unless the permittee has converted all or part of his permit to a lease.

2. A Discovery

In accordance with Sub-section 49 (a), a discovery means the finding of one or more petroleum pools, proved by 2 wells at least half a mile apart, both of which penetrate the same pool or more than one similar pool.

It is confirmed by the Petroleum Directorate that your company has made a discovery in accordance with the definition and consequently you are now in a position to apply to convert to lease all or part of your permits underlain by the discovery in accordance with the Regulations.

3. Development Program

A permittee who wishes to apply to convert to lease shall first present a development program to the Minister, as stipulated in Sub-section 61 (1), for at least one of the petroleum pools discovered in his permit area.

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* All references to "petroleum regulations" or "regulations" in Part I of this document refer to the Newfoundland and Labrador Petroleum Regulations, 1977, unless otherwise noted.

4. Development Program Approval Process

The purpose of the development program approval process is to inform government and the public on the overall characteristics of the proposed developments, and to permit a public examination of the desirability of the proposed developments.

After public hearings, the Minister may approve, approve in principle or reject the development program. The hearings and subsequent approval or rejection by the Minister only relate to the general characteristics of the development program, as defined in Section 67 of the Regulations.

The approval of the Minister gives the permittee the right to convert to lease.

The approval does not:

a) give the right to initiate construction in the lease area.

b) imply approval for the detailed design of the various pieces of equipment or parts thereof.

c) imply approval for the construction methods to be used.

d) give the right to start development drilling, or

e) imply any other approval or right other than the right to convert to lease.

The necessary procedures to be followed with regard to each separate phase of the field development and operation, the specifications and design of each piece of equipment to be constructed and/or installed, and the inspections and measurements to be carried out by the lessee and government will be the subject of further regulations and guidelines.

In addition, there will be further guidelines with regard to the use of local labour, goods and services and the utilization in the Province of any petroleum produced.

The methods and procedures to be followed with regard to the assessment of environmental, economic and social impacts are dealt with under the Environmental Assessment Act and are the subject of separate guidelines attached as Part II of this document.

It should be understood that all guidelines are subject to modification from time to time to meet changing conditions.

5. Information to be Supplied by the Permittee

The information to be supplied by the permittee is specified in Sub-section 62 (1) of the Regulations. The permittee is responsible for the provision of all information, relevant to the development program approval process, concerning the proposed actions of his contractors and sub-contractors.

5.1 Area

Section 75 of the Regulations states that only sections underlain by a discovery can be converted to lease. Consequently, documentation must be provided reasonably proving that the sections included in the proposed development program are underlain by a discovery.

5.2 Technical Capabilities

The permittee must demonstrate the technical capability to safely and efficiently develop the field.

The proposed Hibernia development program will be the province's first offshore oil and gas development and will pose problems not previously encountered by developers in other offshore areas. These include icebergs, pack-ice and the combination of these factors with severe climatic conditions in a productive fishing area. The permittee must demonstrate his understanding of these unique problems.

The permittee must demonstrate the technical capability to solve these problems through project experience and qualifications of personnel of all parties involved in the development.

Past operating experience on the Province's continental shelf and in the Hibernia area in particular, must be carefully described.

5.3 Financial Capability

The Permittee shall:

Estimate the total funds required over the period of the proposed development on an annual basis, assuming that the development program will be approved;

Describe in detail the arrangements with regard to the commitment of each participant in the joint venture, and the proposed financing methods;

Provide reasonable documentation demonstrating that each participating company is financally capable of meeting their commitment. If the development program is considered not financible, or only partially financible at this point in time, the conditions or factors which would make the development program financible should be identified.

5.4 Reserves

The permittee shall include a determination of hydrocarbon reserves on the basis of the volumetric method, and such other methods as may be appropriate. The determination should include a low, medium and high estimate of reserves and indicate the probability assigned to these estimates. This procedure should be employed for each productive horizon within the structure and subsequently summarized for all productive horizons. Estimates are required for both in-place and recoverable reserves of crude oil, natural gas and natural gas liquids. Recoverable hydrocarbon reserves are defined to be those reserves that are preceived to be economically and technologically extractable over the life of the field.

5.5 Reservoir Conditions

The permittee shall describe the reservoir conditions as known at the date of the submission of the development program with particular reference to those conditions which may have a significant impact on decisions with regard to well spacing, production methods and producing rates for all substances over the life of the field.

5.6 Production Methods

The Permittee shall:

Outline the methods to be used for the depletion of the reserves contained in the reservoir. Estimates should be provided for volumes of crude oil produced under primary, secondary and tertiary recovery techniques (where tertiary techniques are relevant), as well as methods for the conservation of natural gas and natural gas liquids.

Describe the procedures for the treatment and/or processing of produced fluids and methods to be employed for the disposal of water and/or gas.

5.7 Production and Transportation Facilities

The permittee shall describe the facilities to be provided for production and transportation of crude oil, natural gas and

natural gas liquids including a description of the safety systems to be employed for the protection of persons and measures proposed for environmental protection. Such a description should include the related onshore facilities.

Provide well documented conceptual designs for production and transportation systems including environmental design criteria and environmental load evaluations. It is assumed that you will continue your detailed design activities on the basis of existing and subsequent regulations. Detailed engineering design drawings, design verification, and stability, risk, and stress analysis, will be required at the appropriate time.

5.8 Marketing

The permittee shall identify the proposed markets and contractual arrangements, if available, for all marketable petroleum produced, the transportation procedures to be employed and a description and the location of the processing and refining facilities.

The Minister reserves the right under Section 103 of the Petroleum Regulations to prohibit the removal of petroleum from the Province where a market exists or is projected to exist in the Province.

5.9 Cost Breakdown

The permittee shall provide a breakdown of the estimated capital and operating cost. The breakdown should include an estimate for all major pieces of equipment, construction materials, the cost of drilling and equipping individual wells, the labor share of various component costs, salaries, maintainence, helicopters, supply boats, insurance, etc.. The cost estimate should relate to properly analyzed and documented conceptual designs for the design, construction, production and transportation phases.

5.10 Labour Requirements

The permittee shall:

Provide a year by year breakdown of the estimated local labour demand by occupation that will be generated by each activity in both the construction and production phases. The estimate should be of sufficient detail to aid the Province in the planning of appropriate education and training programs. Reference should be made to the impact of the project on the size of the Province's labour force, participation rates and unemployment rate.

Highlight the seasonal impact of the employment on the local labour market.

Estimate how much of the required labour will be obtained from within the Province, the impact on local wage scales, the magnitude and type of employment that will be drawn from existing local industries - in particular the fisheries, and the impact of the program on regional labour markets throughout the Province.

5.11 Goods and Services from the Province

The permittee shall estimate the goods and services that he plans to obtain from within the Province. The estimate should include the quantities of the various items or extent of services needed, their value, when and where these goods and services would have to be delivered. It is understood that detailed specifications of many of the goods and services to be obtained locally will not be available during the development program analysis, but shall be submitted after further detailed design work.

5.12 Goods and Services from Outside the Province

The permittee shall:

Provide a description of goods and services that are planned to be obtained from outside the Province, broken down into those that will be obtained from Canadian sources and from foreign sources;

Describe the quantities of goods, extent of services, values, schedules and specifications. Justification for obtaining such goods and services from outside the Province should be included. It is understood that detailed specifications of many of the goods and services to be obtained from outside the Province will not be available during the development program analysis, but shall be submitted after further detailed design work.

5.13 Environmental and Social Impact Statement

The environmental and social impact statement required under the Petroleum Regulations should comply with the requirements of the Environmental Assessment Act of the Province of Newfoundland and Labrador.

Revised guidelines for the preparation of Terms of Reference for an Environmental Impact Statement under the Environmental Assessment Act are attached as Part II of this document.

The environmental impact statement should be submitted to the Minister of the Environment on or before the date of presentation of the Development Program. Public hearings under the Development Program Approval Process will satisfy the requirement for public hearings under the Environmental Assessment Act.

5.14 Environmental and Fisheries Compensation Schemes

The proposed development program shall provide for the establishment of a compensation scheme. The scheme shall provide for compensation for damage to the environment, clean-up costs and losses caused by pollution resulting from the proposed development.

The proposed compensation scheme should make particular provision for compensation for damage to fishing gear and loss of fishing time and catches resulting from such pollution.

The proposed compensation scheme should also make particular provision for compensation for loss or damage resulting from the loss of access to fishing grounds or interference with fishing gear by debris or other obstacles resulting from execution of the development program.

5.15 Environmental Restoration

It is a policy of government that those responsible for environmental disruption should restore the environment in a manner and to a condition acceptable to government before the termination of the lease. Restoration of the environment to its original state is the maximum degree of restoration for which the lessee could be held responsible.

5.16 Onshore Petroleum Related Developments

The Statement on Policy and Plans for Control of Onshore Petroleum Related Developments issued by the Premier on October 17, 1980, describes a process whereby leases may be awarded for specific site development proposals under the Urban and Rural Planning Act and with the first awards to take place June 1, 1981. The actual granting of a lease will be subject to a performance schedule secured by a performance bond. The exclusive right to apply for lease will be valid for a defined period; the Minister may, where circumstances warrant, grant an extension of such application period.

Unconditional leases will not be awarded under the Process for Control of Onshore Petroleum Related Developments for proposed developments which are specifically related to an offshore oil and gas field development, without prior approval under the Development Program Approval Process as described below.

There are three basic types of onshore developments associated wth offshore oil and gas field development:

1. Supply/Services Bases

2. Construction Sites

3. Pipeline Landfall/Terminal Facilities

Some onland development projects may be specifically related to a particular offshore field development while others are not. The awarding of leases for those developments specifically related to a particular field development will be conditional upon the approval of the offshore development program under the Petroleum Regulations.

5.16.1 Supply/Service Base

A lease application for land for the purpose of supply/service base development may be obtained independently from an offshore development program approval process where a supply/service base is not directly related to a particular field development. In such a case, the Regulations under the Urban and Rural Planning Act will apply.

5.16.2 Construction Sites - not related to a specific offshore oil and gas field development

The procedure for obtaining a lease is described in Section 5.16.1.

5.16.3 Construction Sites - related to a specific offshore oil and gas field development

The procedure for issuing of a lease for a construction site largely or exclusively related to a specific offshore oil and/or gas development must be considered in relation to the total petroleum development program. In such cases, the site lease application will proceed jointly with or subsequent to the development program approval process under the Petroleum Regulations.

5.16.4 Terminal Facilities - not related to a specific offshore oil and gas field development

Lease rights for terminal facility sites not related to a specific petroleum development may be obtained independently from an offshore development program approval process as described in Section 5.16.1.

5.16.5 Pipeline Landfalls/Terminal Facilities - related to specific offshore development

The procedure for issuing of a lease for a pipeline landfall/terminal facility site largely or exclusively related to a specific offshore oil and/or gas development must be condisered in relation to the total petroleum development program. In such cases, the site lease application will proceed jointly with or subsequent to the Development Program Approval Process under the Petroleum Regulations.

5.17 Macro-Economic Impact

The permittee shall:

Provide information on the impact of the program on the macro economy of the Province including the levels of income, the growth of the provincial tax base, inflation rates, etc.. Indicate the magnitude, type and location of the indirect employment that will be created.

Adequately describe the impact of the project on the demand for energy, the supply of energy and the resulting energy balances for both the Province and the Country.

5.18 Alternative Methods of Development

Information under this section should be supplied in two parts.

5.18.1 Part one should deal with methods of production and/or transportation which constitute reasonable alternatives to the methods proposed. A clear explanation of the advantages and disadvantages offered by the various alternatives should be provided as well as the justification for the preferred method. The information requested under 5.6, 5.7, 5.9 and 5.13 should be submitted for each alternative.

5.18.2 Part two should describe variations on the selected production and transportation facilities which are both economically and technically feasible in terms of benefits, costs, risks and impacts. The information requested under 5.6, 5.7, 5.9, 5.10, 5.11, 5.12, 5.13, 5.15, 5.16 and 5.17 should be submitted for each variation.

The permittee should provide a substantial assessment of each alternative and/or variation so that reviewers may adequately evaluate their comparative merits.

5.19 Research and Development, Education and Training

In accordance with Section 122 (3) and (4) of the Petroleum Regulations, the permittee shall describe in detail the geological, geophysical, engineering, oceanographic, biological, sociological, economic and such other research to be supported in the Province subsequent to the development program approval.

The permittee shall describe, to the extent possible, the support to be given to the development of capabilities within the Province, to provide products and services and to participate in design activities for the proposed development.

The permittee shall describe to the extent possible the education and training programs to be implemented and/or supported in the Province related to the development as well as the operating phases of the oil field. In addition to support for relevant ongoing education programs and facilities within the Province, it is expected that specific training and/or apprenticeship programs will be designed and instituted to help meet the manpower needs of the offshore oil and gas industry.

6. Criteria for Ministerial Approval

Section 67 lists the criteria on the basis of which the Minister may approve or reject the development program. These criteria are of a general nature, and are expanded upon as follows:

6.1 Safety

With regard to the safety of the operations, the Minister intends to use the following general criteria:

a) The equipment, production methods, operating and training procedures should be such that the proposed developments provide minimal risk of accidental occurrences involving the loss of human life, oil spills, fires, or any other accident which results in injury to persons, damage

to the environment or significant interruptions in the normal continuation of development or production activities.

b) The equipment, production methods or operating procedures proposed by the permittee should be the most technically viable and safest available.

6.2 Appropriate Production Alternatives

Where two or more alternatives exist for the safe development and production of an oil/gas field, the Minister will only approve the development program proposed by the permittee if, in his judgement, it is the most appropriate in relation to the alternatives. The Minister intends to use the following criteria:

The most acceptable production alternative is that which is most appropriate in terms of;

a) environmental risk

b) the interaction between the proposed project and the fishing industry and other uses of the ocean and the seabed

c) social and economic impact on the Province

d) opportunities for the Province to deliver employment, goods and services

e) the delivery of petroleum to the Province

f) cost

g) the relation of the proposed development to other possible oil and gas fields offshore the Province

h) the security of energy supplies, and

i) such other matters as may be presented at the hearings, or otherwise, to the Minister.

6.3 Environmental Impact Studies

The Environmental Impact Assessment should satisfy the criteria specified by the regulations and guidelines under the Environmental Assessment Act of the Province of Newfoundland and Labrador.

6.4 Maximum Use of Goods and Services

The development program should result in the maximum use of goods and services, competitively produced or provided from within the Province.

The permittee should, to this end, implement and/or support Research and Development and Education and Training programs to establish ample capability in the Province to deliver goods, services and employment, competitive in terms of fair market price, quality and delivery schedules.

The permittee should also provide for conditions which would result in maximum use of provincial employment, goods and services of a long term nature during the entire lease period. Where the permittee provides employment and uses provincial goods and services on a short term basis (particularly during the construction period) care should be taken to ensure such hiring or use does not seriously impede or interfere with the development of other sectors in the provincial economy.

6.5 Research and Development

The proposed research activities must be sufficient to develop within the Province significant capabilities in all aspects of the production of oil and gas from the field or fields under consideration. These should include the geochemistry, geophysics, geology, stratigraphy, micropaleontology, reservoir engineering, production engineering, petrophysics, the mechanical and electronical engineering related to offshore and onshore equipment, structural engineering, oceanography, ocean engineering, marine biology, economics, management, data processing, sociology and other related disciplines.

The proposed development activities should provide for the manufacture and provision of oilfield goods and services from within the Province as outlined in Section 6.4 particularly those of a nature that can be sold on an international basis.

6.6 Education and Training

The education and training program shall ensure that:

a) during the operating phase of the oil field, virtually all permanent positions related to the production activities are filled by residents of the Province;

b) during the construction phase, activities carried out in the Province will be carried out to the largest possible extent by residents of the Province;

c) the maximum possible employment of residents of the Province who are unemployed or under-employed is attained; and

d) where the lessee employs residents who are drawn from other sectors in the economy, the program should provide for the financing of compensatory training and education programs in order to assist such other sectors in attracting and employing residents of the Province who are unemployed and under-employed.

6.7 Landing and Use of Petroleum

Preliminary investigations in the Directorate indicate that it is technically and economically feasible to land oil in the Province. The Minister is also of the opinion that it is desirable to land, store and refine the oil from a proposed lease area in the Province in order to provide a secure source of energy, manufacturing activities and employment.

The proposed development program shall, therefore, include provision for the landing and storage of sufficient oil in the Province in such a manner that present or future needs for petroleum products including petrochemicals can be satisfied by refining facilities in the Province.

Preliminary investigations also indicate that it is technically possible to land the associated natural gas in the Province by pipeline.

The proposed development program shall provide for the landing of associated natural gas (excess to the requirements in the lease area) in the Province, if it is economically feasible to do so.

6.8 Costs

The development program shall not necessarily represent the lowest cost option for developing and producing the oil and gas field, but that which is safe, appropriate and consistent with other criteria of the development process.

7. Execution of Development Program

The proposed earliest, most likely and latest date for commencement of the development program should be identified in the program taking into account the proper compliance with the provincial regulations. Any delay in execution of the development program may result in the requirement to resubmit a development plan. It should be noted that there is no moratorium provision in the regulations applicable to lessees.

The lessee shall execute his program strictly as approved by the Minister, as stipulated in Sub-section 71 (1), unless the Minister has approved changes in accordance with Sub-section 71 (2) of the regulations.

As a consequence, the development program should be fully executable from a technical and economic point of view. If, for instance, the permittee decides to present a program on the basis of only some of the pools in the field, such a program must be self-contained and not dependent on further delineation work or the discovery of other pools or fields.

8. Financial Commitments

Any contractual, financial or other arrangement which the permittee wishes to make prior to formal approval of the development program is entirely at his own risk. The Minister, in his evaluation of the development program, shall do so on the basis of legislation and shall not consider himself financially, legally or morally bound by any arrangement entered into prior to his decision.

In addition, the fact that the government may have issued a lease or the right to apply for a lease for onshore petroleum related developments, does not imply any approval of the development plan, or approval of any of the contracts entered into by the permittee with regard to such onshore petroleum related developments.

In order to avoid possible difficulties, a development program should be presented as soon as the permittee is in a position to comply with Section 62 of the Petroleum Regulations.

PART II

GUIDELINES FOR THE PREPARATION OF TERMS OF REFERENCE FOR AN ENVIRONMENTAL IMPACT STATEMENT

GUIDELINES

for the preparation of

TERMS OF REFERENCE

for an

Environmental Impact Statement

for an

OFFSHORE OIL AND GAS DEVELOPMENT PROGRAM

July 1981

Environmental Assessment Division
Department of Environment
Government of Newfoundland and Labrador

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INTRODUCTION

Use of the Guidelines

Whenever the Minister of Environment requires an Environmental Impact Statement (EIS) for a proposed offshore oil and gas development program, the Proponent must prepare and submit to the Minister draft Terms of Reference for the EIS. The Terms of Reference must be approved by the Minister before the Proponent may begin to prepare the EIS.

The following Guidelines are intended to assist the Proponent in the preparation of the Terms of Reference. They include all subjects which may have to be addressed in conducting an environmental assessment of a typical offshore oil and gas development program. It is understood that descriptions of the development and environmental conditions are important only to the degree that they assist in identifying impacts and assist in developing specific mitigating measures.

Each applicable item of the Guidelines should be addressed, reworked and expanded (where appropriate) to make specific reference to the program under assessment and to clearly indicate a commitment by the Proponent to provide the sorts of information called for. The boundaries of any area to be used for the study of local impacts should be well defined by making reference to communities, geographical features or other landmarks. Regional study areas should also be delineated as clearly as possible.

The Proponent should pay particular attention to Part 3.H: "Original Research"; Part 5: "Public Participation"; and Part 11: "Personnel", because these items are of particular importance to the development of acceptable Terms of Reference.

In certain cases, it may be desirable to conduct studies for the EIS in a sequential fashion. If so, the Terms of Reference need not be approved all at once, but instead may be approved sequentially for individual component studies. If the Proponent wishes to proceed in this manner, a proposal describing the strategy for the sequential order of the studies must first be submitted by the Proponent and approved by the Minister.

Any proposal for land-based industrial facililties which are specifically related to the offshore development program should be included in the EIS for the development program. Additional guidelines for the assessment of such facilities are available separately from the Department of Environment.

Staff of the Department are always available to assist the Proponent in understanding the requirements of the Environmental Assessment Process.

The submission of a satisfactory EIS, in accordance with the Environmental Assessment Act, 1980 and the approved Terms of Reference, will be deemed to satisfy the requirements of Section 62.1 (m) of the Petroleum Regulations.

1. SUMMARY

The summary should consolidate the important findings of the report and should be written in such a manner as to allow reviewers to focus immediately on items of concern. It should be written in terms understandable to the general public and in a format that allows it to be extracted directly for publication by the media (if this is required), or for use by senior executives requiring a quick appraisal of the situation.

The summary should briefly describe the project, the probable major environmental impacts, the ameliorating and mitigating measures to be implemented by the Proponent, and the significance of the residual unmitigated environmental impacts. Any aspects of the development which might stimulate public concern should be described with particular clarity. The summary should also clearly identify data gaps or knowledge deficiencies, and the limitations they have imposed on the Environmental Impact Statement (EIS).

2. THE PROPOSED DEVELOPMENT

A. Identity of the Proponent

The Proponent should be identified and should assume responsibility for statements and judgements in the EIS.

B. The Need

The need for the product (s) should be outlined in terms of historic, present and projected demands. Interrelationships between differing and competing processes and/or products as a means to fulfilling demand and location of the demand, should be addressed. Other characteristics including the timing aspects, should be clearly outlined. Adherence to planning schemes of any level of government should be noted.

C. Description of the Project

(i) General Layout

(a) The proposed location (s) of the facilities in relation to principal geographical and environmental factors should be illustrated on topographical maps or aerial photographs of suitable scale. A bathymetric map of appropriately large scale should be included to provide sufficient detail of the specific development area.

(b) Existing features such as the oil and gas permit area, the location and status of wells within the permit area, and all leases, acreages, and ports or marine terminals.

(c) Proposed project features such as pipelines, well sites, platforms, vessels, structures, ports and marine terminals, and all other equipment and facilities inside and out of the lease area.

(ii) Construction Details

The Proponent should describe:

(a) The method of timing of construction for each part of the proposal.

(b) The place and method of obtaining local building materials or services.

(c) Location and other details of transportation facilities and routes.

(d) Location and description of any effluents, emissions, solid waste disposal areas, noise or aesthetic factors caused by the construction.

(e) An inventory of all chemicals to be used in the process and their potential to cause water pollution problems in the event of an unforeseen or uncontrollable circumstance.

(f) Schedules of construction, relocations, development of transportation and other public use facilities for both temporary and permanent employees, (indicate the numbers, sources, and housing needs of the work force).

(iii) Operation and Maintenance

The following items should be detailed with respect to scheduling and methods.

(a) Operational methods and limitations of the proposed production/transfer systems, including anticipated down-times due to weather, ice conditions, etc.

(b) The major timing and other commissioning details of each part of the proposal (s).

(c) The volume, timing, characterization, and other details of expected air emissions, water effluents, noise, solid waste and hazardous solid waste disposal.

(d) The environmental conditions within and adjacent to the production platforms and all associated facilities, to which employees will be exposed -- with particular reference to airborne contaminants and other hazardous or toxic substances.

(e) The aesthetic features of the project.

(f) Any permanent alteration to natural physical processes, caused by the operation.

(g) Manpower requirements.

(h) Information concerning the drilling/production/transportation systems such as certification and inspection requirements, performance history, capacity, blow-out prevention equipment and procedures, design against environmental threats (e.g. moving ice, bottom scouring by icebergs, primary and secondary earthquake effects, etc.), site position systems and/or equipment, navigation and/or communication equipment, and qualifications of personnel.

(i) Proposed methods of handling or disposing of the gas obtained during oil production (re-injection, flaring, transportation).

(j) Information on support craft (air and water) with respect to environemntal threats (e.g. storms, wind, wave, currents and fog, ice and icing conditions, etc.), navigation and communication equipment and qualification of crews.

(k) Marine seismic activities associated with the drilling and production program(s).

(l) Expected releases or stockpiles of waste or toxic substances used or generated during all phases of the project. Identify all potential air, land or water contaminants and outline methods of waste disposal to avoid health hazards to humans and degradation of the environment.

(m) The nature and quantity of non-biodegradable debris released or lost as a consequence of drilling, production and transportation activities.

(n) The quantity and quality of liquid and solid by-products of drilling, production and transportation activities, including oil and oily debris; their storage, disposal and ultimate fate.

(o) Information on water requirements from fresh or marine sources including volumes, seasonal times of extraction, treatment and disposal for domestic or operational purposes.

(p) Sewage treatment and disposal facilities.

(q) The composition, volume and methods of handling and disposal of solid wastes.

(r) The nature (quality and quantity), transportation, storage, use, treatment and final disposition of any biocide, pipe coating materials, anti-corrosion materials, flushing agents, drilling fluids, special lubricants and other toxic substances proposed for use in the project and information on their expected persistence, mobility and ultimate fate in the surrounding environment.

(s) Quantities and qualities of atmospheric emissions such as sulphur compounds, hydrocarbons, nitrogen oxides, water vapour, heavy metals, thermal emissions and any other potential pollutants produced during all phases of the project.

(t) The quantity and quality of other atmospheric emissions such as dust, noise, and odour produced by hydrogen sulphide and other by-products of the project.

(u) Requirments for local contract services, including frequency and timing.

(iv) Decommissioning or Abandonment

The Proponent should describe decommissioning or abandonment procedures including:

(a) Expected life of the project.

(b) Removal of equipment and facilities when the project is terminated, temporarily abandoned or permanently abandoned.

(c) Reclamation and/or stabilization of the production area.

(d) Contingency plans concerning the release or loss of any gaseous, liquid or solid contaminants.

(e) The ultimate disposal of organic and/or mineral waste materials that were stabilized during the construction and operational phase.

D. Alternatives

The Proponent should provide a description of the alternatives considered including those rejected, in sufficient detail to allow the reviewer to comparatively evaluate the environmental risks, costs and benefits of all considerations.

Economic, social and environmental factors for each feasible alternative should be discussed in relation to other alternative to the proposed development. Continued use of existing facilities where they exist, and cancellation of the project should be considered as alternatives.

3. THE PRESENT AND FUTURE ENVIRONMENT (in the absence of the proposed project)

The Proponent should consider and discuss this subject for all areas where environmental impacts might occur and not just at the sites of intensive development. The description should consider all the relevant physical, biological and social parameters contained with the broad environental categories below:

A. Climate

(a) Temperature - normal daily and seasonal variation and extremes.

(b) Winds - velocity, frequency, direction and duration of critical wind speeds, major prevailing direction, stratification.

(c) Precipitation - kind, amount, duration, frequency.

(d) Temperature inversions - type and intensity as they relate to dispersal of atmospheric pollutants and other potential causes of environmental impact.

(e) Incidence of fog in terms of kind, duration and frequency.

(f) Incidence of meteorological phenomena resulting from a combination of components such as wind chill, drifting snow or freezing rain.

(g) Air quality and air pollution potential.

(h) Climactic factors should be considered relative to the proposal in terms of such aspects as snow loads, structural icing, structural design relative to wind or ice stress; low ceilings and/or visibility associated with fog, cloud or precipitation as factors influencing operational efficiency or emergency procedures; wind drift of ice and the movement of toxic substances in open water leads, within cracks, under ice and entrained within the ice; the predictability of wind-driven surface currents, the predictability of wind-waves related to the emulsification of oil or other toxic materials; extreme waves relative to inundation of drilling platforms, service vehicles and staging areas; extreme storms relative to security of drilling platforms, service vehicles, support vehicles and staging areas; an estimate of wave spectra or periodicity which produce the maximum fatigue effects on drilling structures; internal waves related to possible buoyancy changes and natural vibrational periodicities of drilling-rig platforms.

B. Geology & Bathmyetry

(i) Physiographic and tectonic settings and geologic history of the region, including:

(a) Surficial units in the project area.

(b) Bedrock geology and hydrocarbon reserve potential.

(c) Tectonic history and hazards with particular reference to foundation instabilities.

(ii) Surficial and engineering geology with particular reference to properties that are pertinent to review of the project including:

(a) Bathymetry, microtopography and surficial sediment distribution on the sea floor.

(b) Age, lithology, texture, structure and distribution of the surficial geological units underlying the seabed.

(c) Features in the sea-bottom units requiring special engineering considerations such as erosional channels, unconformities, salt domes, boulderfields, gas charged sediments, buried iceberg furrows.

(iii) The spatial distribution of features and the magnitude and frequency of dynamic processes that could affect the project including:

(a) Geopressure.

(b) Faults and slumping.

(c) Surface sediment activity (including sand waves and current scours), conditions of wave and current under which the surface sediments would be mobile. Extent to which sub-bottom sediments will be mobile if the surface sediments are disrupted.

C. Terrain

The geomorphology and biophysical nature of the shorelines which might be contacted by oil originating from the development site (s) or from associated oil transport facilities or vessels.

D. Physical and Chemical Oceanography

(i) Physical oceanogrpahy including currents, flows, tides, periodic motions, gyres, upwelling areas, oceanic fronts, waves, surface and subsurface temperatures, and temperature profiles.

(ii) Chemical oceanography including salinity, dissolved oxygen, nutrients, trace metals, hydrocarbon concentration and composition in the water column and sediments, and other water quality parameters including turbidity.

(iii) Ice Regime:

(a) Icebergs - physical characteristics: shape, size, mass, draft; population; drift; flux; scour; frequency; depth; distribution.

(b) Seasonal Ice Cover - ice pack: distribution, composition; first-year ice, multi-year ice, mechanical properties, ice movement.

E. Biological Resources

(i) Micro-organisms

Distribution and abundance of indigenous microbiota.

(ii) Vegetation

(a) Marine plant communities including phytoplankton and macrophytes, in terms of their species composition, relative abundance, seasonal production, and importance as habitat and food species.

(b) Rare or unique species of particular economic or other value.

(iii) Zooplankton

(a) Species composition, distribution and abundance including seasonal variations.

(b) Seasonal and geographic analysis of biomass.

(iv) Benthos and other Marine Invertebrates

Seasonal analysis of species composition, distribution and abundance, with particular reference to trophic significance and to the commercially important species of shellfish.

(v) Fish

(a) Seasonal distribution and abundance of pelagic eggs and larvae.

(b) Seasonal distribution and abundance of juveniles and adults, with special reference to their movements along coastal areas which could be affected by any activity or occurrence related to the development program.

(c) Behavioral characteristics of commercially important species, with emphasis on seasonally important areas, fish densities, migration behaviour, spawning requirements and sensitivities.

(d) Identification of any critical species which act as important food resources for other co-habiting species.

(e) Identification of any species which may be considered rare or endangered, and species which are important for scientific or recreational reasons.

(vi) Marine Mammals

(a) Population size, seasonal distribution and movements of nearshore and offshore species.

(b) Designation of areas important to any species, e.g., nursery, feeding, calving.

(c) Identification of any species which may be considered rare or endangered, and species which are important for commercial, scientific or recreational reasons.

(vii) Marine Birds

(a) Seasonal distribution, movements and abundance of populations in nearshore and offshore areas.

(b) Location and population estimates of seabird colonies.

(c) Identification of environmental factors which affect the timing of nesting and migration of the various species of marine birds within the development region.

(d) Identification of nesting, breeding and overwintering areas for waterfowl.

(e) Identification of any species which may be considered rare or endangered, and species which are important for scientific or other reasons.

(viii) Biological Systems

(a) Trophic relationships, with emphasis on community structures and multispecies dynamics.

(b) Pre-development levels of potential environmental contaminants in selected indicator species chosen from appropriate trophic levels.

(c) The capacity of biological systems to assimilate pollutants which may result from the proposed development.

F. Human Resources

The following items should be considered as they pertain to the proposed over-all development:

(a) Population numbers, distribution, employment, public facilities and housing in areas which could be significantly affected; this is to include consideration of distinct populations of native people.

(b) The historic, cultural, social and economic setting of the areas which could be affected.

(c) The levels, numbers and types of skills and the general educational level in or relevant to the overall impact area. As well include an inventory of the educational and training facilities in or relevant to the impact area and evaluate their adaquacy in meeting current demand levels.

(d) An inventory of the medical safety and emergency response mechanisms and facilities relevant to the impact area and an evaluation of their adaquacy in meeting current demand levels.

The Proponent should also refer to separate Guidelines for the assessment of associated land-based industrial facilities.

G. Land and Resource Use (present and potential)

The following items should be considered as they pertain to the proposed over-all development:

(a) Fishing and associated industry, with particular reference to: commercial fishing areas and types of gear used; land-based industry dependent on the commercial fisheries, such as fish processing plants and boat-building; and recreational fishing for anadromous species.

(b) Status of any plans for the further development of commercial or recreational fisheries.

(c) Hunting of marine mammals and birds, whether commercial or recreational.

(d) Traditional resource use patterns, e.g., local and/or native hunting and fishing, in areas which could be affected.

(e) Areas of special status such as ecological reserves, sanctuaries, etc.

(f) Areas of importance for recreational, tourism, historic or aesthetic reasons.

The Proponent should also refer to separate Guidelines for the assessment of associated land-based industrial facilities.

H. Original Research

Wherever original research is required to fulfill any of the requirements of Part 3 -- Present and Future Environment, the Proponent will propose appropriate studies designed to produce the required baseline information. These proposals will include specific methodologies and provide details of the kinds of information to be generated.

4. ENVIRONMENTAL IMPACTS

The Proponent should describe and compare the expected environmental impacts of all feasible alternatives in terms of:

(a) Type: positive or negative.

(b) Physical scope: site-specific or wide-spread.

(c) Duration: long-term or short-term; reversible or irreversible.

(d) Significance: high or low.

(e) The existing environmental, economic and social values on a provincial, regional, local or site specific basis; and should identify each in the design, construction, operation and maintenance, and abandonment phases of the development.

The discussion should describe and compare the expected environmental impacts with emphasis on those actions which are likely to cause major environmental disruptions. The assessment of short-and-long term potential impacts should be made on the basis of information collected from existing sources supplemented by field data.

The Proponent should identify all potential sources of pollution and those actions which are likely to cause environmental disruptions. All potential resultant impacts should be considered and discussed in terms of the categories listed below and any others considered pertinent.

A. Air Pollution

The Proponent should consider and discuss impacts which would be likely to occur if circumstances were to prevent adherence to existing air emission standards, i.e., in an uncontrolled situation.

Discussion should also include:

(a) The impacts which would result from the dispersal of atmospheric pollutions under the conditions of a temperature inversion.

(b) The potential hazards to the health or safety of employees which could result from environmental conditions within or adjacent to the plant or associated facilities.

B. Water Pollution

All potential sources of water pollution should be identified including:

(a) Oil spills - well blowout
- storage vessels
- tanker loadings
- tanker ballast water
- tanker traffic
- pipeline transport.

(b) Production water.

(c) Drilling muds and mud additives.

Significant changes in the chemical or physical characteristics of marine waters which might result should be discussed as well as subsequent impacts which should be considered under the appropriate environmental categories.

C. Terrain Damage

Changes in the nature and appearance of shoreline areas contaminated by oil originating from the development site(s) or from associated oil transport facilities or vessels, and the estimated time(s) needed for recovery with and without rehabilitative measures.

D. Impacts on Vegetation

(a) Direct effects on phytoplankton and macrophytes, and consequential effects on food and habitat availability for animal species.

(b) Effects on rare or unique species of vegetation.

E. Impacts on Zooplankton

Direct and indirect effects on zooplanktonic populations with particular reference to seasonal ichthyoplankton and commercially important species of shellfish.

F. Benthos and Other Invertebrates

Physical disturbances and other effects on habitat and food source.

G. Impacts on Fish

(a) Effects on habitat or food sources.

(b) Disturbances to normal behavioral patterns.

(c) Effects on species of particular importance.

H. Impacts on Marine Mammals and Birds

(a) Effects on the habitat of any species.

(b) Direct disturbances to normal behavioral patterns; e.g. effect of gas flaring on mirgration routes; effect of helicopter traffic on bird colonies.

(c) Alteration of environmental factors which affect the timing of nesting or migration.

(d) Effects on species of particular importance.

I. Impacts on Biological Systems

The Proponent should discuss the expected impacts on biological systems in view of the various effects predicted in the foregoing sections of Item 4. This discussion should take into account the predevelopment levels of contaminants and the capacity of the systems to assimilate potential pollutants originating from the proposed development.

J. Impacts on People and Resource Use

The Proponent should describe the impacts on the lives of poeple. This discussion should refer to:

(a) i. Effects on the overall population of the area.

ii. Significant effects on individuals or geographic, age, sex, occupational and other groups or categories where the predicted impact is different from or more intense than for item (a) i, above. Include, as well, employees of the project while on the job.

(b) Effects on the levels, types and numbers of skills and the general educational level as well as the additional demands on the educational and training facilities relevant to the impact area.

(c) Training and response mechanisms related to the safety, medical, and emergency procedures for all phases of the development and the additional facilities (public and private) necessary to meet these requirements.

(d) Effects on the historic, cultural, social and economic environments of the people.

(e) Effects on present and potential resource use, including fishereies, hunting, commercial, recreational and industrial uses.

Particular consideration should be given to potential interference with fishing activities:

- platforms and associated installations
- debris accumulation during construction and operational phases
- supply boat activities
- pipelines to land
- oil fouling of gear, catches and boats

(f) Effects on traditional resource use patterns, such as local and/or native hunting and fishing.

(g) Effects on reserves, sanctuaries and other localities recognized as having significant value.

(h) Visual impacts - effects on scenic natural landscapes.

(i) Noice impacts - effects on local or regional plans for land and resource use.

K. Resource Commitments

The Proponent should describe any irreversible and irretrievable commitments or resources, as required by the proposal, assigning economic values wherever possible.

5. PUBLIC PARTICIPATION IN PREPARING THE EIS

A. Public Information Exchange Program

The Proponent will describe the means by which the residents of the affected areas are to be given opportunities to participate in the researching and production of the EIS, and by which they will be kept informed on both the project itself and the progress of the assessment. Suggestions and recommendations in this regard may be obtained from environmental assessment staff of the Department of Environment.

B. Public Perception of the Project

The opinions of local residents as expressed during the course of the Information Exchange Program will be recorded, analyzed, summarized and discussed in this section. This discussion should address:

(i) The Proposed Development:

- (a) Need
- (b) General layout
- (c) Associated facilites

(ii) The Anticipated Impacts and Major Areas of Concern.

C. The Proponent may also be required to include consideration of public opinion as recorded or interpreted through other forums.

6. SIGNIFICANT IMPACTS, MITIGATION AND RESIDUAL HARMFUL IMPACTS

The reason for attaching significance to a particular effect must be stated and the degree of confidence in the predicted impact qualified. The Proponent should describe and discuss the options and measures available to avoid or mitigate the harmful impacts predicted. The trade-offs involved in proceeding with the development should be made clear.

A. Air Pollution

The Proponent should discuss in detail the measures to be taken to comply with existing regulations, in view of expected levels of emissions. The Proponent should also discuss anticipated public reaction to, and details of mitigating measures in the following categories:

(a) Process upsets which overload control facilities.

(b) Failure of control facilities to function.

(c) An inventory of all materials or chemicals and their likely effect in the event of an unforeseen or uncontrollable circumstance.

B. Water Pollution

The Proponent should discuss the measures to be taken to comply with existing or anticipated regulations. The Proponent should discuss mitigating measures in the following categories:

(a) Minimization of the expected impact of normal discharges on receiving waters.

(b) Minimization of the potential impact of process upsets of failure of some or all of control facilities to function.

(c) Emergency procedures to correct operational problems, and if necessary, to warn the public of the loss of quantities of hazardous material.

C. Terrain Damage

The Proponent should discuss the measures to be taken to minimize the degree of oil damage to shorelines and to offer maximum protection to features having high aesthetic value.

D. Impacts on Vegetation

The Proponent should describe the measures to be taken to avoid or minimize harmful impacts on marine vegetation which could be caused by oil spills, effluent discharges or physical disturbance. Special measures should be proposed to protect any rare or unique plant life.

E. Impacts on Fish and Wildlife

(a) Plans for routing around or otherwise protecting areas used as breeding or staging areas for migratory waterfowl or marine mammals.

(b) Safeguards proposed for the habitats of highly valued, rare or endangered species.

(c) Proposals to minimize disturbances of normal behavioral patterns.

F. Impacts on People and Resource Use

The Proponent should discuss in detail the measures available to avoid or minimize harmful impacts on the lives of people, as predicted in Section 4.I, and to enchance any beneficial impacts within the same categories.

The following are of special importance:

(a) Avoidance of the creation of any significant hazard to the health and safety of project employees or the general public.

(b) Minimization of any harmful impacts on the social and economic environments of regional residents.

(c) Minimization of any interference with traditional, present or potential uses of resource.

G. Environmental Restoration

The Proponent should discuss the measures to be taken, upon the abandonment of the project, to restore the environment in a manner and to a condition acceptable to government.

H. Residual Harmful Impacts

The harmful impacts that will remain after all reasonable mitigative measures have been taken should be discussed in terms of:

(a) The nature, extend and duration of these impacts.

(b) The significance of these impacts within the context of the total human environment of the region and the province.

7. MONITORING AND SURVEILLANCE OF ENVIRONMENTAL EFFECTS

The Proponent should provide information and base-line data prior to construction, and should monitor during and after construction and start-up any potential environmental effects in the following categories:

(a) Water - colour, turbidity, bacteria, water chemistry particularly toxic substance and hydrocarbons.

(b) Air - any parameter which may be significantly affected by the startup of the operation.

(c) Vegetation.

(d) Zooplankton and Benthos.

(e) Fish.

(f) Marine Mammals and Birds.

(g) Toxic Substances and Waste Materials:

- storage
- use and disposal, including tanker discharges
- accumulation in water column and sediments.

(h) Debris: accumulation in vicinity of production facilities and in supply boat traffic lanes.

(i) Briefing of personnel concerning environmental protection measures during the construction and operation of the development project.

8. CONTINGENCY PLANNING

The Proponent should discuss his intended approach to contingency planning recognizing that a detailed contingency plan will be submitted at a later date in response to a regulatory requirement.

A. Risk Analysis and Probability

In order to determine the need for contingency planning, the Proponent should include in the EIS an analysis of the risks associated with the development of the oil and gas, and of the probabililty of episodic and chronic spills of various sizes and types. Measures proposed to minimize the risk of accidental occurrences should also be described. The discussion should include the following items

(a) Type, flow rate and flow duration of gas, oil and other potential pollutants likely to be released during a spill situation from various sources.

(b) Probable phsyical appearance and behaviour of the released hydrocarbon.

(c) Predicted scenarios for the trajectory and dispersion of oil on the surface of the ocean. In this regard, the limitations of the available data base should be clearly noted.

(d) Risks associated with the development activities: operational hazards, tanker traffic accidents; interference with fishing gear and fleets; others.

(e) Threat of a major fire associated with the development.

(f) Risks associated with environmental hazards:

(i) Meteorologic hazards - winds, freezing spray, icing, precipitation, fog; resultant stresses on structures and impacts on construction, production and transportation activities.

(ii) Oceanographic hazards - waves, currents, pack ice and icebergs, probability of occurrence, iceberg scour, stresses on structures and interference with operations.

(iii) Geologic hazards - substrate stability, scour, sandwave motion, liquefaction, mass movement, earthquake frequency, geopressured zones.

B. Contingency Plans

The proposed content of contingency plans should be discussed in general terms (Detailed plans are not required as part of the EIS.) This discussion should address the following points:

(a) The capabilities and limitations of any proposed countermeasures to control pollutants.

(b) The capability, timing and logistics of drilling a relief well, or alternative measures.

(c) The organization and logistics required to track contain and clean up a spill of oil, gas or other pollutant.

(d) Measures for fire prevention, detection and suppression during construction, operation and abandonment of the development.

(e) A proposed training program for field personnel.

(f) Ongoing efforts to increase the effectiveness of existing spill control and clean-up measures.

(g) The ultimate disposal of recovered pollutants including oil and oily wastes.

(h) The restoration of the environment following the control or elimination of an emergency situation.

9. REFERENCES CITED

10. ADDITIONAL BIBLIOGRAPHY, if any.

11. PERSONNEL

The Proponent should provide, as a part of the Terms of Reference, the names, academic qualifications and relevant work experience of those persons who will be responsible for the various components of the EIS.

12. STUDY REPORTS

The Proponent should make a commitment to make available for review by Government and the public, copies of any reports on original studies which have been undertaken in order to prepare the EIS. Such reports are to be made available as soon as possible after they have been produced in final forms, and will subsequently serve as appendices to the EIS.

GUIDELINES

for the preparation of

TERMS OF REFERENCE

for an

ENVIRONMENTAL IMPACT STATEMENT

for a

LAND-BASED INDUSTRIAL FACILITY

related to an
Offshore Oil and Gas Development Program

July, 1981

Environmental Assessment Division
Department of Environment
Government of Newfoundland and Labrador

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INTRODUCTION

Use of the Guidelines

Whenever the Minister of Environment requires an Environmental Impact Statement (EIS) for a proposed industrial plant, the Proponent must prepare and submit to the Minister draft Terms of Reference for the EIS. The Terms of Reference must be approved by the Minister before the Proponent may begin to prepare the EIS.

The following Guidelines are intended to assist the Proponent in the preparation of the Terms of Reference. They include all subjects which may have to be addressed in conducting an environmental assessment of a typical industrial plant. Certain items may not apply to a particular proposal, depending on the type of plant and on the geographical location of the development site.

Each applicable item of the Guidelines should be addressed, reworked and expanded (where appropriate) to make specific reference to the project under assessment and to clearly indicate a commitment by the Proponent to provide the sorts of information called for. The boundaries of any area to be used for the study of local impacts should be well defined by making reference to communities, geographical features or other landmarks. Regional study areas should also be delineated as clearly as possible.

The Proponent should pay particular atttntion to Part 3.D: "Original Research", Part 5: "Public Participation"; and Part 10: "Personnel", because these items are of particular importance to the development of acceptable Terms of Reference.

In certain cases, it may be desirable to conduct studies for the EIS in a sequential fashion. If so, the Terms of Reference need not be approved all at once, but instead may be approved sequentially for individual component studies. If the Proponent wishes to proceed in this manner, a proposal describing the strategy for the sequential order of the studies must first be submitted by the Proponent and approved by the Minister.

Staff of the Department are always available to assist the Proponent in understanding the requirements of the Environmental Assessment Process.

1. SUMMARY

The summary should consolidate the important findings of the report and should be written in such a manner as to allow reviewers to focus immediately on items of concern. It should be written in terms understandable to the general public and in a format that allows it to be extracted directly for publication by the media (if this is required), or for use by senior executives requiring a quick appraisal of the situation.

The summary should briefly describe the project, the probable major environmental impacts, the ameliorating and mitigating measures to be implemented by the assessor, and the significance of the residual unmitigated environmental impacts. Any aspects of the development which might stimulate public concern should be described with particular clarity. The summary should also clearly identify data gaps or knowledge deficiencies, and the limitations they have imposed on the Environmental Impact Statement (EIS).

2. THE PROPOSED PROJECT

A. Identity of the Proponent

The Proponent should be identified and should assume responsibility for statements and judgements in the EIS.

B. The Need

The need for the product(s) or service(s) should be outlined in terms of historic, present and projected demands. Interrelationships between differing and competing processes and/or products as a means to fulfilling demand and location of the demand, should be addressed. Other characteristics including the timing aspects, should be clearly outlined. Adherence to planning schemes of any level of government should be noted.

C. Description of the Project

(i) General Layout

(a) The proposed location(s) of the facilities in relation to principal geographical and environmental factors should be illustrated on topographic or aerial photographs of suitable scale.

General location and extent of an overall impact including resource-based raw material supply can be shown on 1:250,000 scale maps while progressively larger scale maps can be used for exact location of a specific jurisdiction. The jurisdictional areas should be clearly illustrated particularly when more than one may be involved.

(b) Pertinent physical features of the proposal including temporary construction facilities should be defined such as heights of buildings, stacks, outside conveyors, layout of roads, railroads, pipelines, transmission lines etc., particularly as they may relate to existing facilities such as airports, marine terminals, existing railroads, or major highways.

(c) The extent of any area set aside as a buffer zone between the development area and other areas, such as residential or park land, etc., should be delineated.

(d) Areas considered for potential expansion should be outlined.

(ii) Construction Details

The Proponent should describe:

(a) The method and timing for each part of the proposal beginning with the initial surveying and clearing of the site, to the final cleanup after construction is complete.

(b) The place and method of obtaining local bulk building materials; for example quarry products, lumber, cement etc. Also source of water supply (potable, and non-potable).

(c) Construction site security including location of hazardous bulk materials such as fuel and explosives, compressed gases, solvents, etc.

(d) Temporary fencing and routes and frequency of security patrols, access points for construction workers, parking lots (on and off the construction site) should be designated on an appropriate site plan.

(e) Location and other details such as construction and maintenance of access roads, increased use of existing roads and other transportation facilities. On extended construction schedules, the class of roads and their carrying capacity under various climatic conditions including load limitations during spring break-up, should be noted.

(f) Location of watercourse crossings to be used for roads, and railroads associated with the project.

(g) Location, size, duration and services of any temporary construction camps, including those used for preliminary fabrication.

(h) Location of any temporary major service points such as electrical transformers, fire pumps, first aid stations, management and local supervisory and sub-contractor offices and sewage treatment plant.

(i) Interruption or alternation of natural processes such as river flows and lake levels, in terms of timing, degree of change and other pertinent variables.

(j) Location and description of any effluents, emissions, solid waste disposal areas and noise or aesthetic factors caused by the construction.

(k) An inventory of all chemicals to be used in the process and their potential to cause water pollution problems in the event of an unforeseen or uncontrollable circumstance.

(l) An inventory of all chemicals that may be associated with fuel stockpiles, run-off, leaching, deposit of air emissions (e.g., acid rain).

(m) Details of final cleanup and landscaping operations, including measures to conceal such facilities as effluent treatment lagoons, permanent surfacing of exposed ground, and permanent security features such as fencing.

(n) Schedules of construction, relocations, development of transportation and other public use facilities for both temporary and permanent employees. (Indicate the numbers, sources, and housing needs of the work force.)

(iii) Operation and Maintenance

The following items should be detailed with respect to scheduling and methods.

(a) The major timing and other commissioning details of each part of the proposal(s).

(b) Water supply and waste water disposal requirement, in terms of quality, location and volume.

(c) The volume, timing, characterization, and other details of expected air emissions, water effluents, noise, solid waste and hazardous solid waste disposal.

(d) The environmental conditions within and adjacent to the plant and all associated facilities, to which employees will be exposed -- with particular reference to airborne contaminants and other hazardous or toxic substances.

(e) The aesthetic features of the project.

(f) Any permanent alteration to natural processes such as river flows and water quality, air movement, groundwater characteristics, growth of flora, changes in lake levels.

(g) Use of buffer zones to mitigate such effects as noise and air emissions.

(h) Provision for access to the plant without reliance on residential routes.

(i) Changes in traffic volume, type and frequency due to operation.

(j) Requirements for major social and recreational facilities such as schools, churches, etc.

(k) Requirements for local contract services, frequency and timing.

(l) Potential for future expansion on existing proposal site.

(m) Contingency planning for hazardous materials, incidents in transportation, handling and storage.

(n) Provisions for fire protection, either temporary or permanent.

(iv) Decommissioning or Abandonment

The Proponent should describe decommissioning or abandonment procedures including:

(a) Expected life of the project.

(b) Disposition of all buildings and equipment.

(c) Potential uses for buildings with equipment removed.

(d) Criteria which might be used to decide abandonment, including bankruptcy.

(e) Major problems which might occur as a result of abandonment; e.g. fire, air or water contamination.

(f) Reclamantion and/or stabilization of the development area.

D. Alternatives

The Proponent should provide a description of the alternatives considered, including those rejected, in sufficient detail to allow the reviewer to comparatively evaluate the environmental risks, costs and benefits of all considerations.

Economic, social and environmental factors for each feasible alternative should be discussed in relation to other alternatives to the proposed development. Continued use of existing facilities and cancellation of the project should be considered as alternatives.

3. THE PRESENT AND FUTURE ENVIRONMENT (without the proposed project)

The Proponent should consider and discuss this subject under the following headings:

A. Climate and Terrain

(i) Climate

(a) Temperature - normal daily and seasonal variation and extremes.

(b) Winds - velocity, frequency, direction and duration of critical wind speeds, major prevailing direction, stratification.

(c) Precipitation - kind, amount, duration, frequency.

(d) Temperature inversions - type and intensity as they relate to dispersal of atmospheric pollutants and other potential causes of environmental impact.

(e) Destructive storms such as extensive rain, sustained high winds, hurricanes and tornadoes.

(ii) Terrain

(a) Topographic, physiographic, and geological features within the area of the proposed project, particularly those of an aesthetically pleasing nature.

(b) Recognized geological and hydrological hazards such as landslides, mudflows, floods or earthquakes.

(c) Land suitability and capability factors, particularly when large areas are to be utilized or removed from actual or potential other uses such as agriculture or recreation, either as a direct or indirect result of the proposal.

B. Resource Base

(i) Soils, Minerals, Petroleum, etc.

(a) Physical and chemical characteristics of the soils.

(b) Slope stability, natural erosion, or other problems.

(c) Presence of minerals, aggregate resources, petroleum and other resources.

(ii) Water

(a) Biological, chemical and physical characteristics of surface and groundwaters in the proposed area of impact.

(b) Biological and benthological assessment of stream, lake, river or ocean beds.

(c) Velocity, volume, temperature, colour and other physical characteristics of major water bodies affected by the proposal.

(d) Location of water supply sources downstream of the facility at or near surface and ground water bodies.

(iii) Vegetation

(a) Terrestrial, fresh-water and marine plant communities by species composition, their relative abundance, and importance as habitat and food species, with particular reference to timber for lumbering and papermaking operations.

(b) Rare or unique vegetation or plant life of special historic, scenic or economic value.

(iv) Fish and Wildlife

(a) The species and population of crustaceans, fish, amphibians, reptiles, birds and mammals whose habitats may be affected by the proposed development.

(b) Any rare, endangered, commercially or recreationally significant species of fish or wildlife.

(v) People

(a) Population numbers, distribution, employment, facilities and housing in the immediate and outlying areas adjacent to the development; this is to include consideration of distinct populations of native people.

(b) Historic, cultural, social and economic setting of the area.

(c) The levels, numbers and types of skills and the general educational level in or relevant to the overall impact area. As well, include an inventory of the educational and training facilities in or relevant to the impact area and evaluate their adequacy in meeting current demand levels.

(d) An inventory of the medical safety and emergency response mechanisms and facilities relevant to the impact area and an evaluation of their adequacy in meeting current demand levels.

C. Land and Resource Use (present and potential)

On an appropriate scale the following should be broadly outlined:

(a) Agriculture, such as: crops, dairying, mixed farming, grazing, livestock, poultry, as they may be affected by even minor levels of air pollution or water quality degradation.

(b) Forestry, such as timber - mature or immature, protection belts, reforestation projects.

(c) Wilderness, such as: provincial or national parks, established reserves.

(d) Urban, such as: residential, commercial, industrial, recreational.

(e) Archaeological, such as: historic and scenic land use sites.

(f) Ownership and usage of adjacent property.

(g) Status of regional plans for industrial development.

(h) Zoning laws as they affect areas to be developed.

(i) Traditional land use patterns (local and/or native hunting, trapping, fishing and areas of religious significance).

(j) Extraction of non-renewable resources such as minerals, aggregate, fossil fuels.

D. Original Research

Wherever original research is required to fulfil any of the requirements of Part 3 -- Present and Future Environment, the Proponent will propose appropriate studies designed to produce the required baseline information. These proposals will include specific methodologies and provide details of the kinds of information to be generated.

4. ENVIRONMENTAL IMPACTS

The Proponent should describe and compare the expected environmental impacts of the feasible alternatives in:

(a) The long- and short-term.

(b) The light of the existing environmental, economic and social values on a provincial, regional, local or site specific basis, and should identify each in the design, construction, operation and maintenance, and abandonment phases of the project.

The Proponent should consider and discuss all potential impacts in the area to be affected by the proposed industrial project in terms of the categories listed below and any others considered pertinent.

A. Aesthetics of the Plant

Objections to the physical plant can be a major concern. This concern demands subjective decisions as to what constitutes the best visual impact. The Proponent should outline his intentions with respect to the general design and layout of the buildings and adjacent property with regard to:

(a) Height of buildings or process facilities.

(b) Major equipment to be left open to the weather.

(c) Storage areas for surplus equipment.

(d) Loading and unloading facilities.

(e) Supression of emissions which are not normally considered air pollutants (e.g., condensated steam from drying operations).

(f) General landscaping and buffer zones.

B. Air Pollution

The Proponent should consider and discuss impacts which would be likely to occur if circumstances were to prevent adherence to existing air emission standards, i.e., in an uncontrolled situation.

Discussion should include:

(a) The impacts which would result from the dispersal of

atmospheric pollutants under the conditions of a temperature inversion.

(b) The potential for combination of temperature, humidity and emissions causing visibility problems on adjoining highways and streets.

(c) The potential hazards to the health or safety of employees which could result from environmental conditions within or adjacent to the plant or associated facilities.

C. Terrain Disturbance

The Proponent should discuss the disturbance of terrain features under the following items:

(a) Area of land which will be lost irretrievably to the project, i.e., where disturbance will be permanent or very long-term.

(b) Type and degree of temporary disturbance to adjacent lands, and the estimated time(s) needed for recovery with and without rehabilitative measures.

(c) Impacts on aesthetically pleasing features.

D. Impacts on Soils and Related Resources

The Proponent should describe anticipated impacts on soils, minerals, aggregate, etc., which will be caused directly by the project, either by on-site land disturbance and pollution or by extraction from elsewhere for construction purposes. This should be discussed in terms of:

(a) Changes in the physical or chemical characteristics of the soils.

(b) Aggravation of erosion or other problems.

(c) Loss of resources or of access to them.

E. Water Pollution and Related Impacts

Under this heading the Proponent should discuss the following:

(a) Changes in biological, chemical or physical characteristics of surface and ground waters.

(b) Changes in velocity, volume, temperature, colour and

other physical characteristics of major water bodies affected by the proposal.

(c) Potential for alteration of existing water bodies due to erosion, siltation, and the construction of dykes, dams, breakwaters, cribwork, pipeline outfalls, diffusers, etc.

(d) Location and volume of water to be either removed from or added to natural water bodies.

F. Impacts on Vegetation

The Proponent should discuss expected impacts in terms of:

(a) Effects of airborne emissions on local terrestrial flora, both with and without unusual climatic conditions.

(b) Effects on rare or unique vegetation or plant life of special scientific, historic, scenic or economic value.

(c) Effects of effluent discharges on fresh-water or marine flora.

G. Impacts on Fish and Wildlife

This discussion should include:

(a) Effects on the habitat of any fish or wildlife populations.

(b) Effects on any rare, endangered, commercially or recreationally significant species of fish or wildlife.

(c) Any disturbances which may occur in the nesting, spawning or migration patterns of the fish or wildlife due to the proposed project or associated operations.

H. Impacts on People

The Proponent should describe the impacts on the lives of people, particularly but not exclusively within the area of the proposed project. This discussion should refer to:

(a) i Effects on the overall population of the area.

ii Significant effects on individuals or geographic, age, sex, occupational and other groups or categories where the predicted impact is different from or more intense than for item (a) (i) above.

Include, as well, employees of the project while on the job.

(b) Effects on the levels, types and numbers of skills and the general educational level as well as the additional demands on the educational and training facilities relevant to the impact area.

(c) Training and response mechanisms related to the safety, medical, and emergency procedures for all phases of the development and the additional facilities (public and private) necessary to meet these requirements.

(d) Effects on the historic, cultural, social and economic environments of the people.

(e) Effects on present and potential land use, including agriculture, forestry, extraction of non-renewable resources, residential, commercial, recreational and industrial.

(f) Effects on traditional land use patterns, such as local and/or native hunting, trapping and fishing, and on areas of religious significance.

(g) Effects on parks, reserves, and other localities recognized as having significant value as wilderness areas.

(h) Loss of archaeological sites.

(i) Effects on scenic natural landscapes.

(j) Effects on local or regional plans for land and resource use.

I. Noise

Based on current similar operations the Proponent should discuss the expected level of noise from the operations as a potential disturbance factor to people or wildlife, and the anticipated noise levels at various critical distances from the operation including those generated as a result of incoming or outgoing transportation.

J. Resource Commitments

The Proponent should describe any irreversible and irretrievable commitments of resources, as required by the proposal, assigning economic values wherever possible.

5. PUBLIC PARTICIPATION IN PREPARING THE EIS

A. Public Information Exchange Program

The Proponent will describe the means by which the residents of the development area are to be given opportunities to participate in the researching and production of the EIS, and by which they will be kept informed on both the project itself and the progress of the assessment. Suggestions and recommendations in this regard may be obtained from environmental assessment staff of the the Department of Consumer Affairs and Environment.

B. Public Perception of the Project

The opinions of local residents as expressed during the course of the Information Exchange Program will be recorded, analyzed, summarized and discussed in this section. This discussion should address:

(i) The Proposed Project

(a) Need.

(b) General layout.

(c) Associated facilities.

(ii) The Anticipated Impacts.

6. MITIGATION AND RESIDUAL HARMFUL IMPACTS

The Proponent should describe and discuss the options and measures available to avoid or mitigate harmful impacts predicted in Part 4, and in Part 5.B. (ii) where appropriate.

A. Air Pollution

The Proponent should discuss in detail the measures to be taken to comply with existing regulations, in view of expected levels of emissions. The Proponent should also discuss anticipated public reaction to, and details of mitigating measures in the following categories:

(a) Process upsets which overload control facilities.

(b) Failure of control facilities to function.

(c) Emergency procedures in the event of a serious air pollution problem which potentially could cause injury or death over a wide area.

(d) An inventory of all materials or chemicals and their likely effect in the event of an unforeseen or uncontrollable circumstance.

B. Terrain Disturbance

The Proponent should discuss the measures to be taken to minimize the land area lost to the project, to minimize the degree of disturbance to adjacent lands, and to offer maximum protection to features having high aesthetic value.

In general, this will require maximum efficiency in the use of land and strict control over land-clearing activities.

C. Impacts on Soil and Related Resources

The Proponent should discuss the measures to be taken to avoid or minimize the predicted harmful impacts on soil and related resource and -- wherever possible -- to maintain present access to extractable resources.

Enhancement of any beneficial impacts should also be considered.

D. Water Pollution

The Proponent should discuss the measures to be taken to comply with existing or anticipated regulations. The Proponent should discuss mitigating measures in the following categories:

(a) Minimization of the expected impact of normal discharges on receiving waters.

(b) Minimization of the potential impact of process upsets or failure of some or all of control facilities to function.

(c) Emergency procedures to correct operational problems, and if necessary, to warn public of the loss of quantities of hazardous material.

(d) Measures to avoid or minimize physical alteration of existing water bodies.

E. Impacts on Vegetation

The Proponent should describe the measures to be taken to avoid or minimize harmful impacts on vegetation which would be caused by effluent discharges, airborne emissions or physical disturbance. Special measures should be proposed to protect any rare or unique plant life.

Measures should be proposed to enhance beneficial impacts (if any).

F. Impacts on Fish and Wildlife

(a) Plans for routing around or otherwise protecting areas used as breeding or staging grounds for migratory waterfowl or fur-bearers.

(b) Scheduling of construction activities and evidence that the project contains the flexibility to cease construction when areas critical to fish, wildlife, or waterfowl are temporarily threatened.

(c) Safeguards proposed for the habitats of highly valued, rare or endangered species.

(d) Methods of minimizing wildlife harrassment during construction; control of possession of firearms by construction personnel.

(e) Restoration of fish and wildlife habitats following construction.

G. Impacts on People

The Proponent should discuss in detail the measures available to avoid or minimize harmful impacts on the lives of people, as predicted in Part 4.H. (a) to (j) and to enhance any beneficial impacts within the same categories.

The following are of special importance:

(a) Avoidance of the creation of any significant hazard to the health and safety of plant employees or the general public.

(b) Minimization of any harmful impacts on the social and economic environments of local and regional residents.

(c) Minimization of any interference with traditional, present or potential uses of land and water.

H. Noise

The Proponent will describe the measures to be taken to avoid or minimize any impacts of noise from project-related activities on people and wildlife. This might involve the control of noise levels at particular critical times.

I. Environmental Restoration

The Proponent should discuss the measures to be taken, upon the abandonment of the project, to restore the environment in a manner and to a condition acceptable to government.

J. Residual Harmful Impacts

The harmful impacts that will remain after all reasonable mitigative measures have been taken should be discussed in terms of:

(a) The nature, extent and duration of these impacts.

(b) The significance of these impacts within the context of the total human environment of the locality, the region and the province.

7. MONITORING AND SURVEILLANCE OF ENVIRONMENTAL EFFECTS

The Proponent should provide information and base-line data prior to construction, and should monitor during and after construction and start-up any potential environmental effects in the following categories:

(a) Water - colour, turbidity, bacteria, benthos, water chemistry.

(b) Air - any parameter which may be affected by the start up of the operation, such as, sulphur dioxide, particulates, carbon monoxide, nitrogen oxides, etc.

(c) Noise - in decibels at various locations including in particular those in the vicinity of public places such as parks, public buildings, churches, schools, etc. A general statement of the expected effect of earth shocks and noise due to blasting during construction.

Mitigating factors such as trees, noise reduction practices, buffer zones, etc. should be detailed and assessed as to their effectiveness in reducing noise.

(d) Solid Waste - disposal areas for solid wastes and the measures to be taken to mitigate their effects, particularly if there is any involvement with secondary effects such as leachates which may enter a receiving water.

(e) Effects of use of any extraneous control chemicals such as pesticides, herbicides, etc., and information on their expected persistence, toxicity and mobility in atmospheric, aquatic, and terrestrial environments, including ground water.

(f) Briefings to alert personnel of environmental restrictions during the pre-construction, construction, and operation phases.

(g) Continuous surveillance and maintenance programs for the electric power transmission right-of-way.

(h) Plans to monitor the environmental side effects during and after construction, including the progress of revegetation.

8. REFERENCES CITED

9. ADDITIONAL BIBLIOGRAPHY, if any.

10. PERSONNEL

The Proponent should provide, as a part of the Terms of Reference, the names, academic qualifications and relevant work experience of those persons who will be responsible for the various components of the EIS.

11. STUDY REPORTS

The Proponent should make a commitment to make available for review by Government and the public, copies of any reports on original studies which have been undertaken in order to prepare the EIS. Such reports are to be made available as soon as possible after they have been produced in final form, and will subsequently serve as appendices to the EIS.